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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 02/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/660,020

Applicant(s)

RANNEY, JEFFREY T.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-9 and 18-23 are pending after the amendment of 12/22/04.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Bento et al (US 5,250,182).

Bento teaches a nanofiltration system comprising a filtration chamber with an input and output and a nanofiltration membrane, which allows passage of acids and blocks passage of sugars – see 28, Fig 3 and abstract. The system further comprises an acid processing system (33) to further concentrate the acids as in claims 8 and 9.

2. Claims 1-3,5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kwok et al (US 5,554,227).

Claim 1: Kwok teaches nanofiltration system in col 5 lines 17-26. However, Kwok does not specify if the acids would pass through the membrane or not. However,

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this would be inherent. Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). In this case inherency is established by the ref Bento as described in the rejection of claim 1 above.

Claim 2: the system further comprises a chromatographic unit: see fig 2, col 5 lines 16-26, col 5 lines 50-66 and claim 3. What the chromatography unit does, such as performing partial separation, etc., is functional. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990)

Claim 3: feedback line in the system – see fig 2 line28, or 31.

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Claim 5: sugar processing system – crystallizer 26 coupled to the chromatographic unit 25 or 32 (line 35 from unit 32 goes to the crystallizer 22 – see in combination with fig 1.

Claim 7: sugar processing processes sugar to sweetener – crystallized sugar in fig 2. Also this is product by process, “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

3. Claims 1-5,7 and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Paananen et al (US 2004/0006222 A1).

Claim 1: Paananen teaches a nanofiltration membrane as claimed – see figures, and paragraphs 123, 84-87 for the membranes. The membrane would inherently have input and output connections – see paragraphs 89-92. (The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. “The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness.” *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also *In re Grasselli*,

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713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).) and inherently allow passage of sugars as claimed (In re King).

Claim 2: Claim 1 further comprising chromatographic unit: see paragraphs 26-29, figures.

Claim 3: feed back from NF to chromatographic unit – see fig 3.

Claim 4: NF prefilter: this is covered by paragraph 28 – successive and any desired combination.

Claims 5 and 7: further comprising sugar processing system – see para 50 and 28: subsequent systems can comprise more NF and chromatographic systems to recover products; sweetener is a sugar product.

Claim 18: Paananen teaches a nanofiltration apparatus having a chromatographic unit and a nanofiltration unit as claimed – see figures, particularly fig 3, and paragraphs 26-50, 123. Inlets and outlets for both chromatographic unit and NF unit are inherent in the system – In re Napier, etc. passage of acids by the membrane is also inherent – in re King. The limitation of ‘acid used in the biomass hydrolysis..’ is intended use. A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

Claim 19: acid is sulfuric acid: this is intended use – Ex parte Masham.

Claim 20: Feedback line – see fig 3.

Claim 23: thermal evaporative concentration system – see paragraph 93 and 94.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwok'227 in view of Bento'182.

Kwok teaches all the limitations of claims 1 and 2 as follows: Claim 1: Kwok teaches nanofiltration system in col 5 lines 17-26. However, Kwok does not specify if the acids would pass through the membrane or not. However, this would be inherent. Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). In this case inherency is established by the ref Bento as described in the first rejection of claim 1 above. Claim 2: the system further comprises a chromatographic unit: see fig 2, col 5 lines 16-26, col 5 lines 50-66 and claim 3.

Claim 4: Kwok also teaches the further-added limitation of claim 4, a pre-filter nanofiltration membrane. However, Kwok does not teach the-is membrane as allowing the passage of the acids. Bento teaches a nanofiltration membrane which allows the

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passage of acids and prevents the passage of sugary material (see fig 3). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Bento in the teaching of Kwok for separating high sugars from low molecular weight acids as taught by Bento (see abstract) in sugar-acid separation.

Claim 6: Kwok teaches all the limitations of claim 5, ie., sugar processing system – crystallizer 26 coupled to the chromatographic unit 25 or 32 (line 35 from unit 32 goes to the crystallizer 22 – see in combination with fig 1. Kwok does not teach a fermentation/distillation system to process the sugars to ethanol. However, this would be an obvious equivalent of the sugar processing system by election by the applicant. Also, Bento teaches a fermentation/distillation system to process sugars to alcohol. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Bento in the teaching of Kwok to have a fermentation/distillation system for sugar processing as taught by Bento for making ethanol as taught by Bento.

5. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paananen'222 in view of Bento'182.

Paananen teaches all the limitations of claim 18. Instant claims add the further limitations of a sugar processing system which is a fermentation/distillation system for making ethanol, which Paananen does not teach. However, such systems are known in the art, and making ethanol by fermentation of sugars is also well known. Bento teaches a fermentation/distillation system for making ethanol from sugars. It would be obvious to one of ordinary skill in the art at the time of invention to have a

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fermentation/distillation system to make ethanol out of the sugars, and one would use Bento's teaching of making fuel grade ethanol from the sugars as one of the "sugar products" of Paananen (paragraph 50.

Response to Arguments

Applicant's arguments filed 12/22/04 have been fully considered but they are not persuasive.

In response to the arguments against the rejection of claims 1,8 and 9: Bento reference anticipates the claims, as discussed in the rejection. It is agreed that the Bento reference has additional elements/structure than what is claimed, but this would not make the claims patentable over Bento, because the claims are open-ended. With regard to the argument that Bento teaches away, first of all, there is no teaching away in Bento. Teaching away is when the reference teaches against a structure or a process step. In this case, the reference may not be teaching everything disclosed in the applicant's specification, but that is not teaching away. Secondly, A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

In response to the arguments against the rejection of claims 1-3,5 and 7: arguments re whether acids would pass through the membrane or not is not persuasive. Rejection is based on inherency. The membrane used here is as a replacement of a

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chromatographic column, which performs fractionation (col 5 lines 17-26). The apparatus is capable of performing the function even if the purpose of the reference is different. With regard to the decolorization column 25 of the reference, the reference does not say anywhere that the variant of the column, the NF unit, "passes" the sugars. Inherently, this step would be to concentrate the sugars before feeding to the crystallizer 28 (see fig 2) by removing water as permeate. Therefore, there is no teaching away. Also see the above paragraph re teaching away.

Re claim 2, the chromatography column 32 does have the inputs and outputs claimed. Output 34 of the column 32, for example, is *coupled* to the input feed line to the filtration chamber 25 (variant of column 25). Claim 2 does not recite that it is directly coupled, with nothing in between. One of ordinary skill in the art can trace this line in Fig 2. The output 35 would be the first output to supply the separated sugar, which does not go anywhere in the claim (In the reference, see rejection of claim 5 to trace where this line goes). Similarly, the feed back line of claim 3 is line 28 and 31. Claim 3 does not have any additional limitations, nor would the claim language prevent any additional structure.

In response to the argument that the Kwok and Bento references are in different classification: Both the references are included in class 210: fluid separations, and one of ordinary skill would find both in class 210. Class 127 deals with sugars, which is the subject of applicants' invention. Fields of search for the references have no relevance to the present case; the fields of search for the references were based on what was claimed in the references.

Re claim 4, Kwok teaches the nanofiltration membrane pre-filter, and its input and output connections. Recitation of what the inputs and outputs carry is functional language, which the reference membrane is inherently capable of doing. Kwok does not teach whether the pre-filter membrane can separate acids and sugars from the stream. This is a characteristic of the membrane, because different membranes have different characteristics, based on the material and the pore-structure. From Kwok's description, it would not be clear to one of ordinary skill in the art that the pre-filter membrane would inherently separate acids and sugars, because of the high molecular weight cut-offs. Since the reference does not teach this part, the secondary reference is used. Re claim 6, the rejection is very clear. With respect to the argument that the structure and operation in Kwok and Bento do not teach or suggest the system recited: well, the references independently do not teach the claim, and that is why it is an obviousness rejection. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Rest of the arguments are beyond the scope of the claims and dwell on the process, when applicants claim the apparatus.

Conclusion

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This action is made non-final because of the addition of new rejections based on a new reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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